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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/918,814	07/31/2001	Robert F. Enenkel	CA92000-0038-US1	4473
7590	04/30/2004		EXAMINER	
David A. Mims, Jr. International Business Machines Corporation Internal Zip 4054 11400 Burnett Road Austin, TX 78758			DO, CHAT C	
			ART UNIT	PAPER NUMBER
			2124	
			DATE MAILED: 04/30/2004	

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/918,814	ENENKEL ET AL.
	Examiner	Art Unit
	Chat C. Do	2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 31 July 2001.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-17 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) 5 and 14 is/are allowed.

6) Claim(s) 1 and 11 is/are rejected.

7) Claim(s) 2-4, 6-10, 12-13, 15-17 is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 31 July 2001 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948) Paper No(s)/Mail Date. ____.
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
5) Notice of Informal Patent Application (PTO-152)
6) Other: ____.

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitations cited in all the claims must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 6-10 and 14 are objected to because of the following informalities:

Claims 6-10 all depends either direct or indirect on the processor of claim 3. Therefore, the limitation "the method of claim 3" in line 1 of claims 6-10 should change as "the processor of claim 3".

Re claim 14, the limitations "v. conditionally" in line 3 and "x. providing" in line 21 of page 31 should change as "v. conditionally" and "x. providing" respectively. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Markstein et al. (U.S. 5,631,859).

Re claim 1, Markstein et al. disclose in Figure 2A a processor for performing a multiply-add instruction (abstract) on a multiplicand A (read A into 204), a multiplier B (read B into 204), and an addend C (read D into 208), to calculate a result D (output of 210), each of A, B and C being a double-precision floating point number, the result D being a canonical-form extended-precision floating point number (abstract) having a high order component (216) and a low order component (218), each double-precision number and each of the high and low order components of an extended-precision number comprising an exponent and a mantissa, the processor operating on clock cycles (col. 2 lines 48-55) and comprising a multiplier (204), an adder (208 and 210), and a normalizer (212) for computing intermediate results in the computation of the multiply-add instruction, a rounder (214) for rounding intermediate results to the result D, a data path (Figure 2A flow graph from 202 to 220) in the processor to permit data to flow in sequence from the multiplier to the adder to the normalizer to the rounder, and a set of result registers (col. 5 lines 57-61) accepting output from the rounder (214), for

sequentially storing the mantissa of each of the high and low order components of D, the post-adder data path (path from 232-212-214), the normalizer and the rounder each inherently having a data width sufficient to represent post-adder intermediate results (output of 210 and 232) whereby both of the high and low order components of the correctly-rounded result D may be computed, and the data path, the multiplier, the adder, the normalizer and the rounder being arranged to permit the respective mantissas of the high order component of D and of the low order component of D to be stored to the set of result registers on sequential clock cycles of the processor (Figure 2A).

Re claim 11, Markstein et al. disclose in Figure 2A a fused multiply-add processor, an improvement for outputting the mantissa of a canonical form extended-precision number for the result D for the multiply-add instruction $A * B + C$, where A, B and C are double-precision numbers, the result D being a canonical-form extended-precision floating point number having a high order component and a low order component, each double-precision number and each of the high and low order components of an extended-precision number comprising an exponent and a mantissa (abstract), the improvement being characterized by, the post-adder components (210) in the improved fused multiply-add processor (109) for computing intermediate result numbers comprising a post-adder data path (path from 210-232-212-214-216-218-220), a normalizer (212) and a rounder (214), and associated registers (216-218 and col. 5 lines 57-61), each having a bit-width sufficient to represent the mantissas of the intermediate result numbers so as to permit the computation of the mantissa of the extended-precision result D (col. 3 lines 10-17), and logic control in the improved fused multiply-add

Art Unit: 2124

processor to provide a high order word mantissa (216) and a low order word mantissa (218) of the extended-precision result D (output of 214) to a set of result registers in separate clock cycles.

Allowable Subject Matter

6. Claims 2-4, 6-10, 12-13, and 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
2. Claims 5 and 14 are allowed.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - a. U.S. Patent No. 5,329,283 to Smith discloses a synthetic aperture radar digital signal processor.
 - b. U.S. Patent No. 5,341,321 to Karp et al. disclose a floating point arithmetic unit using modified Newton-raphson technique for division and square root.
 - c. U.S. Patent No. 6,557,021 to Brooks et al. disclose a rounding anticipator for floating point operations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (703) 305-5655. The examiner can normally be reached on M => F from 7:00 AM to 4:30 PM.

Art Unit: 2124

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (703) 305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2124

April 27, 2004

Karen Cha
KAKALI CHAKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100